IN THE UNITED STATES DISTRICT COURT FOR THE NORTHERN DISTRICT OF OKLAHOMA

STATE OF OKLAHOMA,)
Plaintiff,)
v.	Case No. 05-cv-329-GKF(PJC)
TYSON FOODS, INC., et al.,)
Defendan	its.)

STATE OF OKLAHOMA'S MOTION IN LIMINE TO PRECLUDE EXPERT TESTIMONY OF DEFENDANTS' WITNESS TIMOTHY J. SULLIVAN, Ph.D. AND INTEGRATED BRIEF IN SUPPORT THEREOF

Plaintiff, the State of Oklahoma ("the State"), pursuant to Fed. R. Evid. 104 and 702 and, Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993), respectfully moves this Court for an order in limine precluding the expert testimony of Defendants' witness Timothy J. Sullivan, Ph.D. ("Dr. Sullivan") on the topics of (1) the trophic state (degree of eutrophication) of Lake Tenkiller (2) whether or not phosphorus from land applied poultry waste runs off from IRW fields, and (3) comparisons of the level of indicator bacteria in IRW rivers and streams with other rivers and streams located in Oklahoma.

I. Introductory Statement

Dr. Sullivan was presented by the integrator defendants, in this case, to opine on several topics including: (1) the trophic state (degree of eutrophication) of Lake Tenkiller (2) whether or not phosphorus from land applied poultry waste runs off from IRW fields, and (3) comparisons of the level of indicator bacteria in IRW rivers and streams with other rivers and streams located in Oklahoma. Pursuant to the relevant law Dr. Sullivan's opinions should be precluded due to his lack of specialized expertise, education, training and experience in limnology (the study of lakes

and reservoirs) and his lack of reliable data or analysis to support his opinions concerning the runoff of phosphorus from land applied poultry waste and his opinions concerning the levels of indicator bacteria in IRW rivers as compared to other Oklahoma rivers. Furthermore, his comparison of the relative levels of bacteria in Oklahoma rivers has no relevance concerning the hazard presented by the indicator bacteria in the IRW rivers, nor does it have any relevance concerning the source of IRW bacteria.

II. Factual Background

Dr. Sullivan does not have formal education in limnology, nor does his published work concern lake/reservoir eutrophication or the trophic state of lakes or reservoirs. In his CV, Dr. Sullivan lists 53 publications in journals and nine books on special issues. Nearly all of this work is related to acid precipitation. There is nothing in his CV related to eutrophication of lakes or reservoirs. *See* Exhibit A (Sullivan Expert Report pp. 140 – 153). Dr. Sullivan's deposition testimony also indicated his lack of experience and expertise in evaluating the trophic state of lakes and reservoirs. *See* Exhibit B (Sullivan Depo. 136:21 – 141:2, 142:11-22, 468:24 - 472:18, 480:1-18 and 497:9-11).

With respect to the issue of whether or not phosphorus or fecal bacteria from land applied poultry waste runs off from fields, Dr. Sullivan admits that his only basis for the opinion is founded solely on his "general sense". See Exhibit B (Sullivan Depo. 346:24 – 353:16) (emphasis added). In this regard, while Dr. Sullivan opines that the Arkansas "phosphorus index" is "intended" to "prevent or reduce the possibility of the movement of phosphorus," he is aware of no research which quantifies the effectiveness of the "phosphorus index" in preventing or reducing phosphorus runoff. See Exhibit B (Sullivan Depo. 356:4 – 357:17; 359:8-12; 362:4-20).

Dr. Sullivan's analysis of water quality violations is based on a geometric mean method of calculation using samples collected *over a 7 year time period*. *See* Exhibit B (Sullivan Depo. 285:21 – 287:3). This is a fatal flaw. Dr. Sullivan's geometric mean calculations do not adhere to the requirements for such calculations as specified by the Oklahoma Administrative Code in Title 785, Chapter 45. In that Rule, the geometric mean must be calculated from *not less than five* (5) samples collected over a period of not more than 30 days. See Exhibit C (Teaf Decl. at ¶ 9).

III. Legal Standard

Federal Rule of Evidence 702 provides:

If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness *qualified as* an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise, if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case. (emphasis added).

Thus, "Fed. R. Evid. 702 imposes on the trial judge an important 'gate-keeping' function with regard to the admissibility of expert opinions." *Ralston v. Smith & Nephew Richards, Inc.*, 275 F.3d 965, 969 (10th Cir. 2001). As an initial matter, the court must determine the expert is qualified by "knowledge, skill, experience, training, or education" to render an opinion. *Id.*While many Ph.D.s are qualified as experts it is important for the court to delineate exactly what discipline their expertise lies in. *See Berry v. City of Detroit*, 25 F.3d 1342, 1351 (6th Cir. 1994), *cert. denied*, 513 U.S. 1111, 115 S. Ct. 902, (1995). *See also, Wheeling Pittsburgh Steel Corp. v. Beelman River Terminals, Inc.*, 254 F.3d 706, 715 (8th Cir. 2001) ("To begin with, we agree with the district court that Dr. Curtis . . . easily qualifies as an expert under Federal Rule of Evidence 702. The real question is, *what is he an expert about?*") (emphasis added); *Westfed*

Holdings, Inc. v. United States, 55 Fed. Cl. 544, 571 (2003), rev'd in part on other grounds, 407 F.3d 1352 (Fed. Cir. 2005). This very court when examining an expert's qualifications stated:

Ralston and like cases establish that the qualification of the proposed expert is to be assessed only after the specific matters he proposes to address have been identified. The controlling Tenth Circuit cases, exemplified by Ralston, establish that the expert's qualifications must be both (i) adequate in a general, qualitative sense (i.e., "knowledge, skill, experience, training or education" as required by Rule 702) and (ii) specific to the matters he proposes to address as an expert. In re Williams Sec. Litig., 496 F. Supp. 2d 1195, 1232 & 1245 (N.D. Okla. 2007) (Emphasis added).

Next, the court must ensure that the scientific testimony being offered is "not only relevant, but reliable." *See Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 589 (1993).\(^1\) "To be reliable under *Daubert*, an expert's scientific testimony must be based on scientific knowledge" *Dodge v. Cotter Corp.*, 328 F.3d 1212, 1222 (10th Cir. 2003). The Supreme Court has explained that the term "scientific" "implies grounding in the methods and procedures of science." *Daubert*, 509 U.S. at 590. Likewise, it has explained that the term "knowledge" "connotes more than subjective belief or unsupported speculation." *Id.* Thus, "in order to qualify as 'scientific knowledge,' an inference or assertion must be derived by the scientific method. Proposed testimony must be supported by appropriate validation -- *i.e.*, 'good grounds,' based on what is known." *Id.*

The Supreme Court has set forth four non-exclusive factors that a court may consider in making its reliability determination: (1) whether the theory or technique can be (and has been) tested, *id.* at 593; (2) whether the theory or technique has been subjected to peer review and publication, *id.*; (3) the known or potential rate of error and the existence and maintenance of

The Supreme Court held in *Kumho Tire Co. v. Carmichael*, 526 U.S. 137 (1999), that the gatekeeping function set out in *Daubert* applies not only to expert testimony based on scientific knowledge, but also expert testimony based upon technical or other specialized knowledge -- *i.e.*, it applies to all expert testimony.

standards controlling the technique's operation, *id.* at 594; and (4) whether the theory or technique has general acceptance in the scientific community, *id.* The inquiry is "a flexible one." *Id.*; *see also id.* at 593 ("[m]any factors will bear on the inquiry, and we do not presume to set out a definitive checklist or test"); *Dodge*, 328 F.3d at 1222 ("the list is not exclusive"). "The focus [of the inquiry]. . . must be solely on principles and methodologies, not on the conclusions that they generate." *Daubert*, 509 U.S. at 595.

To be relevant, the testimony must "assist the trier of fact to understand the evidence or to determine a fact in issue." Fed. R. Evid. 702. This consideration has been described as one of "fit." *See Daubert*, 509 U.S. at 591. "'Fit' is not always obvious, and scientific validity for one purpose is not necessarily scientific validity for other, unrelated purposes." *Id*.

In sum, "[t]he objective of [the gatekeeping] requirement is to ensure the reliability and relevancy of expert testimony. It is to make certain that an expert, whether basing testimony upon professional studies or personal experience, employs in the courtroom the same level of intellectual rigor that characterizes the practice of an expert in the relevant field." *Kumho Tire*, 526 U.S. at 152.

Finally, the party proffering the expert scientific testimony bears the burden of establishing admissibility under the Federal Rules of Evidence and *Daubert*. *See Ralston*, 275 F.3d at 970 fn. 4.

IV. Argument

A. Dr. Sullivan's opinions and testimony concerning the trophic state of Lake Tenkiller are unreliable because he is unqualified and lacks the requisite knowledge and experience to testify as an expert regarding lake/reservoir eutrophication.

As a threshold question, before the court can examine an expert's opinion as to relevance and reliability, it must determine whether that expert is qualified, through education and experience, to offer the opinions they intend to provide. *See Ralston*, at 969. In this instance, it is clear that Dr. Sullivan, like the experts in *In re Williams* and *Ralston*, is unqualified, as a matter of law, to opine as an expert concerning the trophic state of Lake Tenkiller. As such, the court must preclude his testimony.

Dr. Sullivan does not have formal education in limnology and in particular, the processes that cause eutrophication of waters and thereby affect the trophic state of a reservoir such as Lake Tenkiller. Nor has Dr. Sullivan performed any significant research relating to the trophic states of lakes. *See* Exhibit A (Sullivan Expert Report pp. 140 – 153). His deposition testimony confirms his lack of experience in this area. For example, his only study of lake eutrophication involved solely a review of other people's evaluation and provided a synthesis of their work:

- Q What factors did you look at when identifying lakes that would be impacted by atmospheric nitrogen deposition?
- A We looked at published material. This document was restricted to a synthesis of published material, so we looked at the extent to which studies had been conducted that had identified lakes as being sensitive in terms of eutrophication to nitrogen inputs, and what kinds of lakes they were and what the conditions were whereby that would be likely to occur.
- Q Did you do any other analysis besides that, to identify which lakes would be sensitive?
- A Well, I just relied on the studies that had been published to evaluate the issue. I mean, I didn't try to take lake A and determine if it's nitrogen limited or not.

Exhibit B (Sullivan Depo. 140:2 – 15). When asked whether he had ever done any research or issued any opinions concerning trophic state, Dr. Sullivan admitted he had not. *See* Exhibit B (Sullivan Depo. 140:24 – 141:2). Thus, it is apparent that Dr. Sullivan does not have the specific qualifications necessary to support his opinions on the trophic state of Lake Tenkiller. *See, Wheeling Pittsburgh Steel Corp. v. Beelman River Terminals, Inc.*, 254 F.3d 706, 715 (8th Cir. 2001). The expert's knowledge "must be specific to the matters he proposes to address as an expert." *In re Williams Sec. Litig.*, 496 F. Supp. 2d 1195, 1232 & 1245 (N.D. Okla. 2007).

Here, Dr. Sullivan does not demonstrate specific knowledge about eutrophication processes that affect the trophic state of Lake Tenkiller.

B. Dr. Sullivan's opinion regarding phosphorus and bacteria runoff is unreliable because it is void of any supporting data, analysis or test.

Dr. Sullivan admits that his only basis for the opinion as to whether phosphorus and bacteria runs off is founded solely on his "general sense:"

Q (By Ms. Burch) The -- in the event that there is a place where you can land apply phosphorus and it is not going to run off, are there places like that in the Illinois River watershed?

A There are places in the Illinois River watershed where one would not expect that there would be appreciable movement of phosphorus from that area to another area or, in particular, to a nearby stream. That's probably the majority of the land area, but **I've not conducted analyses** to try to determine that it's the majority of the land area, but that would be my **general sense**, that there are certain areas that have conditions such that one would expect that the opportunity for phosphorus to move is probably there, at least some portions of it, and that there would be an increased risk of phosphorus movement under storm conditions typically. And so there are conditions that are reasonably well understood and defined where you expect to find those areas, and then the other areas you expect to not find that situation.

See Exhibit B (Sullivan Depo. 348:21 – 349:18) (emphasis added). Also, as established, while Dr. Sullivan seems to believe that Arkansas' "phosphorus index" is effective in reducing or eliminating phosphorus runoff, he is aware of no study or research quantifying its effectiveness in this regard. Thus, Dr. Sullivan's opinions concerning runoff are not based on scientific knowledge or study, but just his general sense. Daubert requires more than a "general sense." "To be reliable under Daubert, an expert's scientific testimony must be based on scientific knowledge" Dodge v. Cotter Corp., 328 F.3d 1212, 1222 (10th Cir. 2003). "Scientific" implies that the opinion is based on the methods and procedures of science. Daubert, 509 U.S. at 590. Plainly, Dr. Sullivan's opinions concerning runoff do not meet this standard.

C. Dr. Sullivan's opinion concerning the bacterial water quality of Oklahoma rivers is unreliable and irrelevant because he failed to use the applicable standard proscribing the calculation of geometric means.

Dr. Sullivan's analysis of water quality violations is based on the geometric mean method of calculation. Unfortunately, he calculated the means using sampling data collected from over a 7 year period. See Exhibit B (Sullivan Depo. 285:21 – 287:3). The applicable Oklahoma rule clearly provides that such a calculation must be limited to samples collected over a 30 day time period. See Exhibit C (Teaf Decl. at ¶ 9 and exhibit attachment thereto). As noted by Dr. Teaf, Dr. Sullivan's bacterial analysis based on an incorrect calculation means the calculations cannot be used to legitimately compare the water quality of different rivers. See Exhibit C (Teaf Decl. at ¶ 10). Thus, again, he seeks to offer an opinion that fails to be supported by a reliable scientific method. Daubert, 509 U.S. at 590. Further, because he did not apply the correct standard, Dr. Sullivan's geometric mean calculations are irrelevant to whether Oklahoma's water quality standards are being violated.

D. Dr. Sullivan's opinion concerning the bacterial water quality of Oklahoma rivers is irrelevant because he failed to ascribe bacterial sources to individual waterbodies in the state.

Dr. Sullivan's analysis and comparison of bacterial water quality is not only unreliable and irrelevant because he failed to follow the State's procedures for calculating a geometric mean, his overall concept of comparing the bacterial levels of IRW rivers with other Oklahoma rivers should be precluded because it is also irrelevant. Fed. R. Evid. 702. As noted by Dr. Teaf, simply because another river in Oklahoma is contaminated by bacteria it does not mean that the rivers of the IRW have not been contaminated by the land application of poultry waste as well. Clearly, there are a multitude of potential sources of bacteria in any watershed and the significance of any potential source of bacteria depends on the particular circumstances involved in the watershed at issue. As explained by Dr. Teaf, an expert in risk assessment:

More importantly, however, [Dr. Sullivan] makes no specific effort to ascribe bacterial sources to individual waterbodies in the state. This is a critical point, because while numerical bacterial levels may be similar among one or more waterbodies, their sources from location to location may be different. In one area, the principal source may be poultry waste, in another it may be urban runoff, in another it may be sewage treatment effluent. In terms of the risk posed by PBCR uses of streams in the IRW, it is irrelevant what values may be observed elsewhere in Oklahoma, just as it is irrelevant what levels may be observed in Pennsylvania, or Texas, waterbodies.

Exhibit C (Teaf Decl. at ¶ 10). Accordingly, Dr. Sullivan's opinions relating to IRW bacterial water quality based on a comparison of the water quality of other rivers in Oklahoma should be excluded on the basis of relevancy.

V. Conclusion

WHEREFORE, in light of the foregoing, this Court should enter an order in limine precluding the expert testimony of Defendants' witness Dr. Sullivan on (1) the trophic state (degree of eutrophication) of Lake Tenkiller (2) whether or not phosphorus from land applied poultry waste runs off from IRW fields, and (3) comparisons of the level of indicator bacteria in IRW rivers and streams with other rivers and streams located in Oklahoma.

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